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ABSTRACT

This paper provides the researchers interested in the psychological effects of school space on students' learning and behavior with a description of selected resources. Source materials are divided into five categories: (1) general background information lists of bibliographies, directories, encyclopedias, books, and libraries; (2) abstracting and indexing services; (3) periodicals with articles focused on the behavior-environment-design interface; (4) organizations to provide information on relevant research, conferences, and publications; and (5) current awareness sources to supply recent information to users without access to reference libraries. (NRB)

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PSYCHOLOGICAL EFFECTS OF SCHOOL SPACE ON STUDENTS' LEARNING AND BEHAVIOR

Selected Source Materials

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

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Prior to 1960 most of the research on the effects of classroom environment on students' learning and behavior was limited to studies which looked at only isolated aspects of the physical environment, such as light, sound, or temperature. Today, however, a growing body of literature exists on the behavior-environment-design interface, particularly as it relates to the use of space.

Spatial requirements, for example, are known to affect all manner of interpersonal and intrapersonal relationships. Crowding and a perceived restriction on movement have generally been shown to have negative effects on learning. On the other hand, no adverse effects have been reported in studies involving the relationship of pupil anxiety and mental health to underground space structures. A problem exists, however, in locating information such as this. The interdisciplinary nature of the field (behavior-environment-design) as yet has no common recognized name. Sources are scattered throughout publications in environmental psychology, urban planning/design, cultural anthropology, education, and architectural psychology.

This paper is therefore intended to provide the researcher who is interested in the psychological effects of school space on students' learning and behavior with a description of selected sources which might otherwise remain buried in the literature of the various fields. Naturally, with such a vast area of study to cover, the reader is encouraged to view these selected resources as only a base on which to expand and update his information.

An overview of the types of information covered in this paper is presented in the form of an INFOGRAM (see Fig. 1).

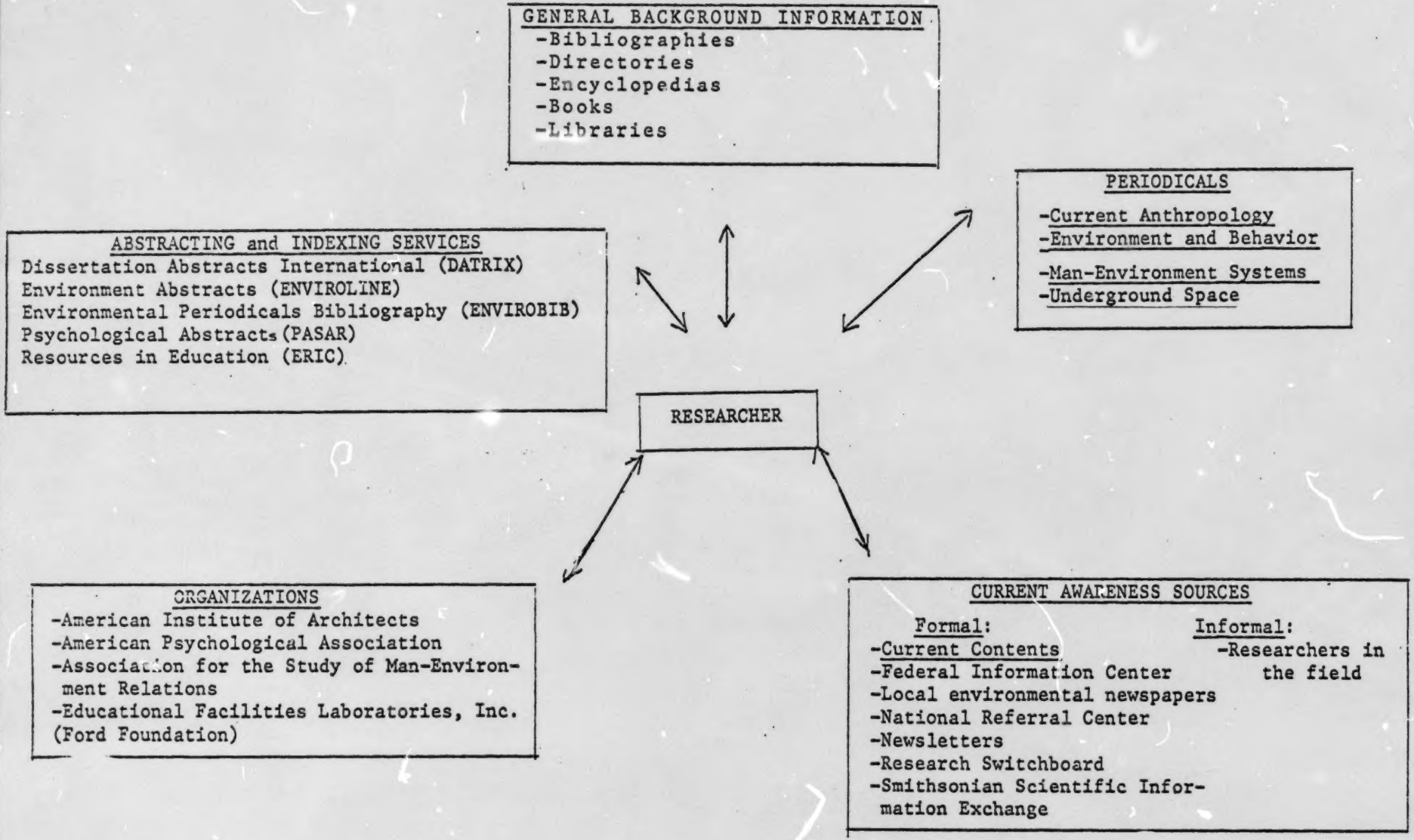

Figure I - INFOGRAM

GENERAL BACKGROUND

Several bibliographies of topical interest have been published in the Exchange Bibliography series by the Council of Planning Librarians (M. Vance, Editor, P.O. Box 229, Monticello, Illinois 61856). The following provide access to the most important directories, abstracting and indexing services, periodicals, books, information systems, and organizations concerned with the behavior-environment-design interface.

No. 673-Research on Architecture and Human Behavior, W. Preiser, 1974. Contains only a list of sources.

No. 677-Kenneth Craik's Environmental Psychology, T. Ottar, 1974. Provides a description of research paradigms in addition to listing of sources.

No. 678-Irving Altman's Environmental Psychology, R. Matthews, 1974. Fairly comprehensive review of the literature, plus the usual source list.

Directories are primarily information-locating tools. Of particular interest to the reader of this paper are the following:

International Directory of Behavior and Design Research, ASMER, Inc., Orangeburg, N.Y. 1974.

This directory is a valuable reference for locating persons currently involved in behavioral and design research. Individuals are indexed by work location, by discipline, and by current research interests. (For specific names and addresses, see the Current Awareness Source section of this paper.)

Directory of Special Libraries and Information Centers, 4th edition, Gale Research Co., Detroit, Michigan, 1977.

Describes approximately 14,000 special libraries and information centers in the U.S. and Canada. Volume 2 includes a geographic index which enables one to quickly locate the nearest special collection on the topic of interest. A recent addition has been the

periodic supplement, New Special Libraries, which is issued four times during the interim between editions of the basic work.

Encyclopedias are excellent sources for literature summaries. One such,

> The Encyclopedia of Education (E. Blishen, Editor, Philosophical Library, New York, N. Y., 1970)

includes a pertinent summary of research related to classroom design (space) and student learning. It is of limited value, however, due to the 1970 publication date.

Two books bear mentioning for their contribution to an overview of the behavior-environment-design interface.

Gutman, R. People and Buildings, Basic Books, New York, N. Y., 1972.

A useful selection of 26 articles, tightly organized in 5 sections. One of the best readers in this area.

Lang, J. C. et al. Designing for Human Behavior: Architecture and the Behavioral Sciences, Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1974.

Includes important summaries of architecturally relevant behavioral research, research methodologies, and major issues such as the relationship between designer and designed-for.

Special collection libraries, in addition to housing or procuring the above materials on request, may also be helpful as sources for institution-specific publications and/or personal contacts. The reader is urged to refer to the Directory of Special Libraries and Information Centers described previously for a listing of such institutions in his/her geographical area.

ABSTRACTING AND INDEXING SERVICES

Each of the abstracting and indexing services described below has its own computerized data base listed in parentheses.

Dissertation Abstracts International (DATRIX)
(Xerox University Microfilms, Ann Arbor, Mich.)

The Comprehensive Dissertation Index with its annual supplements provides access to all North American doctoral dissertations accepted for degree requirements during the preceding year. Two relevent titles are "An Investigation of Relationships Between 5th Grade Students' Perception of the Physical Classroom Environment and Observed Environmental Factors" (R. Faust, Columbia University, 1976) and " The Behavioral Ecology of Interactional Space" (R. Deutsch, Yeshiva University, 1975).

Environment Abstracts (ENVIROLINE)
(Environment Information Center, Inc., 292 Madison Ave., New York, N. Y.)

This highly useful source is published monthly (bimonthly May/June and Nov/Dec.) and has an equally valuable counterpart, The Environment Index, an annual publication. Its scope includes abstracting of journal articles, books, hearings, conference papers, monographs and statistical reports. A vast clearinghouse for environmental information serving clients in 50 nations.

Environmental Periodicals Bibliography (ENVIROBIB)
(Environmental Studies Institute, Santa Barbara, Calif.)

Issued bimonthly, with a cumulative annual index, this guide to 265 U.S. and foreign periodicals in environmentally related studies has the unique feature of reproducing the tables of contents of selected periodicals. Most helpful to the researcher who likes to browse!

Psychological Abstracts (PASAR)
(American Psychological Assn., 1200 17th St. N. W., Washington, D.C.)

Published monthly with semi-annual author and subject indexes (3 year cumulative indexes), this source is rich in behavior-environment related literature. However, the reader would do well to familiarize him/herself with the Thesaurus of Psychological Index Terms. This approach may save considerable time in searching for a specific topic in the environment-behavior-design interface, such as "space."

Resources in Education (ERIC)
(Educational Resources Information Center, National Institute of Education, 300 6th St. S.W., Washington, D.C.)

Issued monthly with semi-annual cumulations, this source, too, is best searched by using its companion thesaurus, The Thesaurus of ERIC Terms. RIE provides abstracts on fugitive-type papers such as the one entitled "The Differential Effects of Spatial Density on Low and High Scores on Behavioral Problem Indices" (research presented at the Annual Meeting of the Western Psychological Assn., Seattle, Wash., 1977).

PERIODICALS

Key periodicals which invariably include articles of relevance for the behavior-environment-design interface include:

Current Anthropology (5801 Ellis Ave., Chicago, Ill.)

Serves as a clearinghouse for new ideas and builds a broad, interdisciplinary knowledge base. The format is unusual because most of its scholarly presentations are accompanied by two or more critical comments by other subject area experts. A case in point is E. Hall's article, "Proxemics," Current Anthology, 9:3-95.

Environment and Behavior (Sage Publications, 275 S. Beverly Dr., Beverly Hills, Calif.)

This journal is "concerned with the study, design, and control of the physical environment and its interaction with human behavioral systems." Obviously, it should have priority value for the reader of this paper. A few of the pertinent articles which have appeared in recent issues are listed below.

Barash, D. "Human Ethology: Personal Space Reiterated, "Environment and Behavior, 5: 67-72.

Stokols, D. "Physical, Social,and Personal Determinants of the Perception of Crowding," Environment and Behavior, 5:87.

Wandersman, A. "User Participation: A study of Types of Participation, Effects, Mediators and Individual Differences," Environment and Behavior, 11:185-208.

Man-Environment Systems (Assn. for the Study of Man-Environment Relations, Inc., Orangeburg, N. Y.)

Researchers needing a forum for communications bearing on the interface between research in the behavioral/social sciences and the design/management of the physical environment will find this bimonthly publication quite readable. Its loose-leaf format includes good reviews of the literature. Unfortunately, there appears to be some interruption of service from time to time.

Underground Space (Pergamon Press, Inc., Elmsford, N.Y.)

This periodical is relatively new to the field, first appearing in 1976. Published quarterly, it sells for $18.00 a single copy! Despite the prohibitive cost, Underground Space fills a void; it is the only periodical devoted exclusively to interdisciplinary communication on matters concerned with the development of the underground. The current state of that art is examined in the first of the two citations which follow. The second is a report on two studies of an underground elementary school in New Mexico to determine whether the structure has any adverse effect on the children's learning and behavior.

Labs, K. "The Architectural Underground," Underground Space, 1:135-156.
Lutz, F. "Studies of Children in an Underground School," Underground Space, 1: 131-134.

ORGANIZATIONS

Private organizations generate an abundance of information through the research they sponsor, the conferences they hold, and the publications they issue. The American Institute of Architects (1735 New York Ave. N.W., Washington, D.C.) and the American Psychological Association (1200 17th Street N.W., Washington, D.C.)are both examples of this type of organization. Additionally, the latter has recently established a special task force on environment and behavior. The association for the Study of Man- Environment Relations (ASMER), as mentioned earlier, compiles the International Directory of Behavior and Design and publishes Man-Environment Systems. Educational Facil-

ities Laboratories, Inc., a subsidiary of the Ford Foundation, was responsible for carrying on a five-year research project that evaluated the extent to which the learning process is affected by the physical environment. This project, known as the School Environments Research, was published at University of Michigan, Ann Arbor, 1956, 1965.

CURRENT AWARENESS SOURCES

The sources described in this section all share one common feature: they can supply current information to a user who does not have a suitable library nearby. Some, such as the computerized information retrieval systems, are advantageous to the researcher who does not have the time to regularly search the professional literature. Other current awareness sources, e.g., newsletters and special newspapers, serve to keep the reader abreast of developments in the field on a weekly basis. Perhaps the best source is the one which either formally or informally puts the researcher in direct contact with other professionals in the field.

The Smithsonian Science Information Exchange (1730 M St., N.W., Washington, D.C.) is an example of a computerized information system which prepares summary descriptions of research in progress It is updated monthly and lists researchers and policy makers as its target user community.

Current Contents, published weekly by the Institute for Scientific Information (325 Chestnut St., Philadelphia, Pa.) reprints the tables of contents of major journals. Of the six different editions available, the reader will probably find the one entitled "Behavioral and Social Sciences" the most appropriate, This source also includes an address directory. Another printed source, Task Force on Environment and Behavior, is a newsletter published by the American Psychological Association (1200 17th St. N.W., Washington, D.C.). Finally, local newspapers published by special interest groups such as Central New York Environment (Box 204, Jamesville, N. Y.) often contain information of more than local origin. For example, a recent issue (Aug.-Sept. 1979) reprinted a brief article from Conservation News on the growing popularity of underground space structures.

Several telephone referral centers enable the researcher to get first-hand information on very short notice. The Research Switchboard (telephone: 1-202-785-7351 of the American Institute of Architects) is a referral service for researchers seeking access to architects working on specific problems. The National Referral Center (telephone: 1-202-426-5670 at the Library of Congress, Washington, D.C.) is an "information desk" which directs the user to an organization or individual with specialized knowledge on a subject. Federal Information Centers, maintained throughout the country by the General Services Administration, provide information on programs and services of the Federal Government. Toll-free calls may be made from specified cities within the U.S. For a complete list of the Centers and the cities with tie-line numbers, see the 1978/79 United States Government Manual, available at any library.

Of a less formal nature are the personal contacts which provide researchers with an opportunity to share current interests and findings. The following individuals, along with their areas of expertise, were located in the International Directory of Behavior and Design Research described earlier.

Peterson, Ronald W.
University of Utah, Psychology Dept.
Salt Lake City, Utah (telephone: 1-801-581-8885)
Interest: Student perception of the classroom environment

Pollowy, Anne-Marie
Faculte de l'Amenagement
Universite de Montreal
Montreal, Quebec, Canada (telephone: 1-514-343-7467)
Interest: Architectural-environmental guidelines for children

Williams, David and Shaw, Leland
Bureau of Research
College of Architecture and Fine Arts, Room 102 A
University of Florida
Gainesville, Florida (telephone: 1-904-392-0221)
Interest: Creative learning spaces

Sources for the study of the interdisciplinary field of behavior-environment-design are widely scattered. Moreover, the specific area

on which this paper focused (i.e., the psychological effects of school space on students' learning and behavior patterns) is even more difficult and time-consuming to research. This is largely due to the fragmentary research which has been completed thus far. Even so, no comprehensive overview exists for that which is complete. Neither is there a single source giving a complete overview of design-related behavioral research methods. Remediation of these two weak areas would be beneficial, as would the establishment of a commonly recognized name for the behavior-environment-design interface.

APPENDIX

Broch, E., & Rygh, J. Permanent underground openings in Norway: Design approach and some examples. Underground Space, 1, 87-100.

Carter, D. et al. Terraset school. Underground Space, 1, 317-323.

Heyman, M. Space and behavior: A selected bibliography. Landscape, 13, 4-10.

Meyer, J. Gophers go underground. Civil Engineering, 48, 76-79.

Pryce, A., & Newitson, V. (eds.) Conference on the psychological consequences of crowding. European Scientific Notes, 32, 77-78. U. S. Office of Naval Research Branch Office, 1978.

Schiffenbauer, A. et al. The relationship between density and crowding - some architectural modifiers. Environment and Behavior, 9, 3-14.